**What is claimed is:**

1. A system for estimating a set of mathematical model parameters, the system comprising:

at least one sensor configured to produce sensory data; and

a control circuit producing at least one control parameter, the control circuit maintaining a mathematical model as a function of a number of system operating conditions including either of the sensory data produced by the at least one sensor and the at least one control parameter as well as the set of mathematical model parameters, the control circuit responsive to the number of system operating conditions to periodically update a group of matrix cells of a data matrix, and to estimate the set of mathematical model parameters based on the updated data matrix.

2. The system of claim 1, wherein the control circuit includes a memory device having stored therein the data matrix.

3. The system of claim 1, wherein the control circuit includes a memory device, the control circuit configured to store the estimated set of mathematical model parameters in the memory device.

4. The system of claim 1, further including an input terminal receiving a trigger signal indicative of a trigger event, the control circuit responsive to the trigger signal to populate the data matrix with default values.

5. The system of claim 4, wherein the default values include output values of the mathematical model calculated using default parameter values.

6. The system of claim 4, wherein the trigger signal includes an ignition signal from a vehicle key switch.

7. The system of claim 4, wherein the trigger signal includes a data signal received from an engine sensor.

8. The system of claim 1, further including an input terminal receiving a trigger signal indicative of a trigger event, the control circuit responsive to the trigger signal to retrieve saved mathematical model parameter values from a memory location and populate the data matrix with output values of the mathematical model, the output values calculated using the retrieved mathematical model parameter values.

9. The system of claim 8, wherein the trigger signal includes an engine start signal from a vehicle key switch.

10. The system of claim 8, wherein the trigger signal includes a signal received from an engine sensor.

11. The system of claim 1, further including an input terminal receiving a trigger signal indicative of a trigger event, the control circuit configured to determine the number of trigger signals received and populate the matrix based on the number of trigger signals.

12. The system of claim 11, wherein the trigger signal includes an engine start signal from a vehicle key switch.

13. The system of claim 11, wherein the trigger signal includes a signal received from an engine sensor.

14. The system of claim 1, wherein the at least one sensor configured to produce sensory data includes a fuel collection unit pressure sensor configured to produce a pressure signal indicative of a pressure of a fuel collection unit.

15. The system of claim 1, wherein the at least one control parameter includes a fuel injector on-time value.

16. The system of claim 1, wherein the control circuit includes a control circuit configured to calculate an output value of the mathematical model based on the number of system operating conditions and update the data matrix with the output value in response to receiving the number of system operating conditions.

17. The system of claim 1, wherein the control circuit includes a control circuit periodically updating a row of a data matrix in response to receiving the number of system operating conditions, the control circuit configured to determine the row of the data matrix based on the values of at least a portion of the number of system operating conditions.

18. The system of claim 1, wherein the control circuit includes a control circuit periodically updating a column of a data matrix in response to receiving the number of system operating conditions, the control circuit configured to determine the column of the data matrix based on the values of at least a portion of the number of system operating conditions.

19. The system of claim 1, wherein the data matrix includes an M by N+K data matrix wherein M represents a number of operating condition ranges, N represents a number of mathematical model inputs, and K represents a number of mathematical model outputs.

20. The system of claim 1, wherein the data matrix includes an M+K by N data matrix wherein M represents a number of mathematical model inputs, K represents a number of mathematical model outputs, and N represents a number of operating condition ranges.

21. The system of claim 1, wherein the data matrix includes a data matrix wherein each data matrix row is a representation of a range of operating conditions and each data matrix column is a representation of one of an input and output of the mathematical model, the control circuit configured to determine the data matrix row by selecting a row of the data matrix representing an operating condition range including values of at least a portion of the number of system operating conditions.

22. The system of claim 1, wherein the data matrix includes a data matrix wherein each data matrix column is a representation of a range of operating conditions and each data matrix row is a representation of one of an input and output of the mathematical model, the control circuit configured to determine the data matrix column by selecting a column of the data matrix representing an operating condition range including values of at least a portion of the number of system operating conditions.

23. The system of claim 1, wherein the control circuit includes a control circuit configured to estimate the set of mathematical model parameters based on the updated data matrix using a regression algorithm.

24. The system of claim 23, wherein the regression algorithm includes a least squares regression algorithm.

25. The system of claim 1, wherein the mathematical model is a fuel quantity estimation mathematical model.

26. A method for estimating a set of mathematical model parameters for a mathematical model of a system operating parameter, the method comprising the steps of:

determining a number of system operating conditions;

selecting a group of matrix cells of a data matrix based on values of the number of system operating conditions;

updating the selected group of matrix cells of the data matrix based on values of the number of system operating conditions; and

estimating the set of mathematical model parameters based on the updated data matrix.

27. The method of claim 26, further comprising calculating an output value of the mathematical model based on values of the number of system operating conditions.

28. The method of claim 27, wherein the updating step includes updating the selected group of matrix cells of the data matrix with the output value.

29. The method of claim 26, further comprising constructing the data matrix in a memory location.

30. The method of claim 29, wherein the constructing step includes constructing an M by N+K data matrix wherein M represents a number of operating condition ranges, N represents a number of mathematical model inputs, and K represents a number of mathematical model outputs.

31. The method of claim 29, wherein the constructing step includes constructing a M+K by N data matrix wherein M represents a number of mathematical model inputs, K represents a number of mathematical model outputs, and N represents a number of operating condition ranges.

32. The method of claim 26, further comprising populating the data matrix with default data values prior to the determining step.

33. The method of claim 32, wherein the populating step includes populating the data matrix with an output value of the mathematical model calculated using a set of default mathematical model parameters.

34. The method of claim 26, further comprising retrieving a set of stored parameter values from a memory location prior to the receiving step.

35. The method of claim 34, further comprising populating the data matrix with default data values subsequent to the retrieving step and prior to the receiving step.

36. The method of claim 35, wherein the populating step includes populating the data matrix with output values of the mathematical model calculated using the set of stored parameter values.

37. The method of claim 34, further comprising populating the data matrix with output values of the mathematical model calculated using the set of stored parameter values if a present execution of the method is a first execution of the method and populating the data matrix with default output values otherwise.

38. The method of claim 26, further comprising storing the set of estimated mathematical model parameters in a memory location after the determining step.

39. The method of claim 26, wherein the determining step includes receiving pressure data from a fuel collection unit pressure sensor configured to produce a pressure signal indicative of a pressure of a fuel collection unit.

40. The method of claim 26, wherein the determining step includes determining a fuel injector on-time value.

41. The method of claim 26, wherein selecting a group of matrix cells of a data matrix includes selecting a row of the data matrix.

42. The method of claim 26, wherein the selecting step includes selecting a row of the data matrix representing an operating condition range, the operating condition range including values of at least a portion of the number of system operating conditions.

43. The method of claim 26, wherein selecting a group of matrix cells of a data matrix includes selecting a column of the data matrix.

44. The method of claim 26, wherein the selecting step includes selecting a column of the data matrix representing an operating condition range, the operating condition range including values of at least a portion of the number of system operating conditions.

45. The method of claim 26, wherein the estimating step includes determining the set of mathematical model parameters based on the updated data matrix using a least square regression algorithm.

46. A method for estimating a set of mathematical model parameters of a fuel quantity estimation model, the method comprising the steps of:

receiving sensory data from a number of data sensors;

selecting a row of a data matrix based on values of the sensory data in response to the receiving step;

updating the selected row of the data matrix based on the sensory data; and

estimating the set of mathematical model parameters based on the updated data matrix using a least squares regression algorithm.